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Trauma Exposure, Depression, Suicidal Ideation, and Alcohol Use in People with Severe Mental Disorder in Ethiopia

Short title: Trauma, Depression, and Alcohol Use in People with SMD

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Abstract

Purpose: To investigate exposure to traumatic and stressful events and their association with depression, suicidal ideation, and alcohol abuse in people with severe mental disorder (SMD) in Ethiopia.

Methods: As part of the Programme for Improving Mental health carE, 300 people with SMD (84% primary psychosis, 11% bipolar disorder, 16% depression with psychotic features) in a rural district were identified by psychiatric nurses. A cross-sectional assessment included clinical characteristics, experience of being restrained, exposure to stressful events as measured by an adapted version of the List of Threatening Experiences scale, traumatic events as measured by endorsement of 13 locally-relevant potentially traumatic events that occurred since the onset of the participant's mental illness, depression symptoms measured by the Patient Health Questionnaire, the Suicidal Behavior Module of the Composite International Diagnostic Interview, and hazardous which was calculated as a sum score of eight or higher on the Alcohol Use Disorders Identification Test.

Results: Almost half of participants reported being restrained since becoming ill, which was associated with more suicidal ideation and less hazardous drinking. More than one-third experienced traumatic events since becoming ill, including being assaulted, beaten, or raped. Exposure to traumatic events was associated with hazardous drinking.

Conclusions: In this rural Ethiopian setting, people with SMD experienced high levels of traumatic and stressful events which were associated with co-morbid conditions. Greater attention needs to be given to trauma prevention and integration of treatment for trauma sequelae in efforts to expand integrated mental health care.

Keywords: alcoholism, depression, psychotic disorders, life change events, post-traumatic

Introduction

In high-income countries, people with severe mental disorder (SMD) report higher rates of traumatic events [1-3] than the general population[4], and one-quarter to one-half of people with SMD are estimated to have posttraumatic stress disorder (PTSD) [5,6]. In people with SMD, having a trauma history is associated with worse symptoms [7-13], poorer medication adherence [14], and inferior treatment outcomes [10]. Moreover, people with SMD and comorbid PTSD have more depression [15,13] and drug and alcohol abuse [14,16] than people with SMD alone.

In most low- and middle-income countries (LMICs), SMD is the most common form of mental illness presenting at primary care clinics [17-19] and is among the top contributors to the overall burden of disease in Ethiopia [20]. Although rates of trauma exposure among people with SMD are unknown in most LMICs, in Ethiopia researchers have documented that 25% of people with SMD in Ethiopia die from unnatural causes [21], suggesting potentially high rates of trauma exposure. In addition, high rates of stigma, neglect, restraint, human rights abuses, and physical and sexual violence against people with SMD have also been documented in Ethiopia [22-33]. Exposure is likely exacerbated due to extremely limited access to mental health services available in LMICs, particularly in rural areas [34,35].

Aims of the Study

Despite the high likelihood of exposure to traumatic and stressful events in people with serious mental illness in low- and middle-income countries, little is known about how these factors might contribute to comorbid mental health concerns including depression, suicidal ideation, and alcohol abuse in this already vulnerable population. This study investigates rates of exposure to traumatic and stressful events in people with serious mental illness living in rural Ethiopia, and explores factors that predict exposure to these events including demographic and psychiatric variables, and the association between exposure to these events and depression, suicide and suicidal ideation, and alcohol abuse.

Material and Methods

Procedures

Study setting

This study uses secondary data [36] from the Ethiopia site of the PRogramme for Improving Mental health carE (PRIME) study that was collected between December 2014 and July 2015. PRIME is a large-scale, multi-country mental health services research program investigating the implementation of evidence-based packages of care for priority mental, neurological and substance use disorders, including SMD [37,38,31]. Data were collected in Sodo district in the Gurage zone of the Southern Nations, Nationalities and Peoples' Regional state of Ethiopia. Approximately 160,000 people live in Sodo district, which is 90% rural [39]. Sodo has eight health centers which each serve between 25,000 and 40,000 people [39].

PRIME staff trained 65 health extension workers (community health workers) and 26 community members and leaders in Sodo District to detect and refer people with suspected SMD. A previous study in the region found that key informant detection was effective in identifying cases of people with SMD [40]. The half day training was conducted by psychiatrists and supervised psychiatric nurses using case vignettes of common presentations of SMD in the Ethiopian context.

People with suspected SMD who attended primary care were initially assessed by primary care workers (nurses and health officers) who had been trained in the World Health Organization's mental health Gap Action Programme (mhGAP) course [41,42] and then underwent a confirmatory diagnostic assessment by psychiatric nurses using the Operational Criteria Checklist for Psychotic and Affective Illness (OPCRIT) [43]. Psychiatric nurses received seven days of training in administering the OPCRIT by senior Ethiopian psychiatrists, which included observed interviews and feedback [36].

Identified individuals received psychiatric medication and basic psychosocial care, support and monitoring in the Sodo District primary care clinics [31]. They were then assessed

for eligibility for recruitment into the study using the following criteria: a diagnosis of a psychotic disorder or bipolar disorder, ability to provide informed consent or guardian permission, planning to stay resident in the area for at least 12 months and ability to converse in Amharic, the official language of Ethiopia. No one was excluded because of language.

Measures

Psychiatric diagnoses were pulled from the OPCRIT assessments conducted by the psychiatric nurses. Diagnoses were grouped into psychotic disorders, bipolar disorder, and major depression with psychotic features. The following self-report measures were administered in an interview format by data collectors:

Sociodemographics. Self-reported demographic indicators including sex and age.

Psychiatric variables. Psychiatric symptoms including psychotic, depressive, and manic symptoms were assessed using the 24-item Brief Psychiatric Rating Scale Expanded Version 4.0 (BPRS-4.0) [44]. Items in the BPRS are scored 1 (absent) to 7 (extremely severe), and the scale score was the sum total. The internal consistency of the scale was good (Cronbach's alpha = .81). Participants also reported their duration of mental illness in years.

Traumatic Events. Exposure to traumatic events was assessed by positive endorsement of 13 locally-relevant potentially traumatic events (e.g., assault, rape, being hit by a car, being maltreated in prison) that occurred since the onset of the participant's mental illness. The 13 trauma event items were developed by the researchers based on their understanding of the common trauma events that affect patients with SMI in rural Ethiopia. The scale score was the total sum score of the 13 items.

Restraint. Experience of being restrained was assessed by two items, one that asked whether participants had been restrained since the start of the illness, and a second that asked if participants had been restrained in the last 12 months.

Stressful Events. Stressful life events in the past six months were assessed using an adapted version of the List of Threatening Experiences scale (LTE) that assesses whether a

participant has experienced 11 life events that have been rated as very stressful by community samples [45]. The 12th item, which asks whether "anything else seriously upset you" was not included in the adapted measures, so the scale score is the sum total of exposure to the 11 events.

Mental Health Outcomes. Depression symptoms were assessed using the 9-item Patient Health Questionnaire (PHQ-9) [46], which has been culturally validated in rural Ethiopia [47]. The PHQ assesses the presence of depression symptoms from 0 (not at all) to 3 (nearly everyday) over the past two weeks. The scale score was the total sum score and the internal reliability was acceptable (Cronbach's alpha = .65). Suicidal ideation and suicide attempt in the last year were assessed by two single items from the Suicidal Behavior Module of the Composite International Diagnostic Interview (CIDI) [48] which asked "Have you thought of taking your life in the past 12 months?" and **"**Have you attempted to take your own life in the past 12 months?" Hazardous drinking was calculated as a sum score of eight or higher on the Alcohol Use Disorders Identification Test (AUDIT), which assesses drinking behavior over the past three months [49].

Data Analysis

Descriptive statistics were calculated for all sociodemographic and psychiatric variables. Univariate regression analyses were conducted to determine whether any of the sociodemographic or psychiatric variables were associated with exposure to restraint in the last 12 months, traumatic events or stressful events. Chi-square analyses and t-tests were used to assess gender differences in exposure to restraint, traumatic events or stressful events. Bivariate analyses assessing the association between sociodemographic and psychiatric variables and each of the four mental health outcomes were run to identify factors that should be included in the final multiple regressions. Sex, age, and psychiatric variables that were significantly associated with a mental health outcome (p-value<.05) were included in the final

regressions predicting those outcomes. Finally, four multiple regressions were conducted in which restraint, total traumatic events, and total stressful events were included as predictors of the four mental health outcomes: depression symptoms, suicidal ideation, suicide attempt, and hazardous drinking, after accounting for covariates. Multiple regression using chained equations and 20 multiply imputed datasets was used to account for missing data in the four multiple regressions. All analyses were conducted using Stata version 14 [50].

Results

Participants

Of the 300 participants who were diagnosed with SMD by the psychiatric nurses, 43% were women and the mean age was 36 years (SD=13, range: 18-82 years) (Table 1). The great majority of participants had a psychotic disorder (n=246, 84%), of which most (n=200, 81%) had schizophrenia, 11% had bipolar disorder, and 16% had depression with psychotic features. The median number of years that participants reported that they had been living with mental illness was 9 (Interquartile Range (IQR): 4 to 18, range: 0-70 years). Most participants were jobless (31%), farmers (25%), or housewives (21%), while 7% were daily laborers, 5% owned a business, 3% were students, 1% were pensioners, 1% worked for a private firm or the government, and 5% were classified as “other” which include participants reporting that they were “patients.” Of the 300 participants, 13 (4.33%) had some missing data for age (1 participant), BPRS-E (6 participants), and years living with mental illness (6 participants).

Exposure to traumatic and stressful events

Almost half of participants (46%) reported that they had been restrained at some point since becoming ill, with one-quarter (25%) experiencing restraint in the last year. Men (30%) were more likely to be restrained in the last year than women (18%); older people and those who had been ill for longer were less likely to be restrained (Table 2).

More than one-third of participants (36%) reported that they had experienced at least one of the 13 traumatic events since they became ill, with 21% experiencing at least two events. Men reported experiencing more traumatic events than women (Table 2). The most commonly reported traumatic events were being assaulted (24%) or beaten (20%). Being raped by a community member or friend was reported by 7% of the women and none of the men. Participants with higher scores on the BPRS (psychiatric symptoms) reported less exposure to traumatic events (Table 1).

Almost 70% of participants reported experiencing a stressful life event in the past six months, with the most common events being experiencing a serious illness or injury (27%) and joblessness (27%) (Table 2). There were no gender differences in whether participants experienced a stressful event or how many stressful events they experienced, but significantly more men (42%) than women (30%) reported having a financial crisis (X^2=4.91, p=.03) (Table 2).

Mental health

Participants scored an average of 11.26 (SD=5.11) on the PHQ, with 268 (89.33%) scoring at or above the clinical cut-off for depression [47] suggesting high levels of depression symptoms. Moreover, 37% of participants reported suicidal ideation and 14% reported suicide attempt in the past year. In addition, 45% of men and 12% of women (31% total) reported hazardous drinking in the past three months.

Traumatic and stressful events predicting mental health

After controlling for covariates, hazardous drinking in the past three months was positively associated with exposure to traumatic events since illness (OR=1.45, p=.009) and negatively associated with being restrained during the last 12 months (OR=0.36, p=.003) (Table 3). Increased depression symptoms in the past two weeks were positively associated with experiencing stressful events in the past six months (b=0.66, p<.001). Suicidal ideation in the past 12 months was positively associated with being restrained in the past 12 months

(OR=2.02, *p*=.017) and the number of stressful events in the past six months (OR=1.37, *p*<.001). There was a trend towards suicide attempts in the past 12 months being positively associated with number of stressful events in the past 6 months (OR=1.19, *p*=.056).

Discussion

People living with SMD in Ethiopia experience high levels of traumatic and stressful events in addition to coping with SMD. While the data are cross-sectional and directionality cannot be inferred, results indicate that traumatic and stressful events are associated with, and may be influencing, mental health and substance abuse in this population, and/or mental health and substance abuse may be influencing increased exposure to traumatic and stressful events.

Almost half of participants reported that they have been restrained at least once since becoming ill, including one in four who has been restrained in the past year. Men seem to be at particularly high risk of being restrained, with one in three men being restrained in the last year. Being restrained in the past year was associated with increased reports of suicidal ideation and decreased reports of hazardous drinking. It may be that restraint exacerbates suicidal ideation, or that participants who are suicidal are more likely to be restrained by their family members in an effort to keep them from harm. Similarly, restraint may reduce access to alcohol and therefore limit hazardous drinking. This hypothesis aligns with a qualitative study in Sodo District that found that the primary reason for restraint was to protect the individual with mental illness or to protect the community from the individual. This was particularly true when access to treatment was limited or nonexistent [51].

More than one-third of participants reported experiencing potentially traumatic events since becoming ill, including being assaulted, beaten, or raped by a community member or friend. While only women reported that they had been raped, overall, men were more likely to report experiencing traumatic events, and this gender difference was primarily driven by their higher exposure to being beaten, assaulted, or hit by cars. This gender discrepancy in exposure to traumatic events may be driven in part by men being exposed to the community more than

women, and this interpretation may be supported by the increased rate of traumatic events among participants with less severe psychiatric symptoms. These participants may be more likely to be outside of the home and may therefore be more at risk of experiencing traumatic events. Exposure to traumatic events since illness was positively associated with increased risk of engaging in hazardous drinking in the last three months. Trauma exposure may increase propensity to engage in hazardous drinking. Conversely, people with SMD who engage in hazardous drinking may also be more likely to end up in potentially harmful situations.

Finally, most participants experienced a stressful life event in the past six months and stressful life events positively predicted depression symptoms and suicidal ideation, and there was a trend towards stressful life events positively predicting suicide attempts. Participants who experience stressful life events may have worsening depression and suicidal ideation [52], which may in turn increase the likelihood of experiencing a stressful life event such as joblessness, financial insecurity or marital difficulties [53].

This study has some limitations. As noted above, the study is cross-sectional and so directionally of effects cannot be inferred. In addition, the study only includes participants with SMD in Ethiopia, and the identified relationships may not be generalizable to other populations. Moreover, all measures were self-report which may introduce bias into the measures. This study is a secondary data analysis, and data on PTSD symptoms or diagnoses were not collected in the original study. Therefore we are unable to determine whether PTSD symptoms were associated with trauma exposure or whether PTSD symptoms mediated or moderated associations between trauma exposure and other mental health or hazardous drinking outcomes. Similarly, participants were not asked about their subjective experience of the reported potentially traumatic events, and so we do not know whether participants experienced these events as “traumatic.” Finally, It is likely that caregivers may have answered some questions on behalf of patients that were deemed too ill to answer for themselves. Unfortunately we are not able to identify the assessments in which this took place. Another limitation

concerns the ambiguity of the stressful life event “serious illness or injury.” The Amharic version of this item includes physical and mental illness and so could apply to all of the participants in this study. However only 27% of participants endorsed this item. This response rate suggests that many participants may have interpreted this item to mean primarily physical illness, and/or that participants did not endorse having a mental illness. Unfortunately are unable to determine how participants may have interpreted this item. Finally, we had limited power to detect a significance difference in the prediction of suicide attempt. The trend towards significance suggests that the relationship between stressful events and suicide attempt may have achieved significance with a larger sample size.

Despite these limitations this study is strengthened because the sample was comprised of all the people in one district in Ethiopia who were confirmed to be living with SMD, which increases the generalizability of the results. Moreover, despite the fact that people with SMD in LMICs are at high risk of stigma, neglect, restraint, human rights abuses, and violence [22-33], this is one of the first studies in an LMIC to look at trauma exposure and its association with mental health in people with SMD. Knowledge of factors that may precipitate or exacerbate mental health symptoms may assist with developing innovative interventions to improve the well-being and functioning of this vulnerable population. This may be particularly critical in LMICs and other low-resource settings with limited access to mental health services [34,35].

Around the world people with SMD experience a disproportionate amount of traumatic and stressful events. These events may confer greater risk of comorbid conditions including depression, suicidal ideation, and alcohol use which may further compromise their functioning and increase their risk of experiencing future harmful events. Treatment for people with SMD is often limited to medication management, particularly in low resource settings. However, as mental health systems develop, there may be opportunities to integrate trauma prevention and treatment into services for people with SMD, which may improve their mental health, even if other psychiatric symptoms are still present.

Declarations

Ethics Approval and Consent to Participate

The study was approved by the Institutional Review Board of the College of Health Sciences of Addis Ababa University. The secondary analyses presented here were reviewed by the Boston University Medical Campus Institutional Review Board and were determined to not be human subjects research. All participants gave informed consent to participate.

Competing Interests

The authors declare that they have no competing interests.

References

1. Cohen CI, Palekar N, Barker J, Ramirez PM (2012) The relationship between trauma and clinical outcome variables among older adults with schizophrenia spectrum disorders. Am J Geriatr Psychiatry 20 (5):408-415. doi:10.1097/JGP.0b013e318211817e

2. Goodman LA, Salyers MP, Mueser KT, Rosenberg SD, Swartz M, Essock SM, Osher FC, Butterfield MI, Swanson J (2001) Recent victimization in women and men with severe mental illness: prevalence and correlates. J Trauma Stress 14 (4):615-632. doi:10.1023/a:1013026318450

3. Alvarez MJ, Masramon H, Pena C, Pont M, Gourdier C, Roura-Poch P, Arrufat F (2015) Cumulative effects of childhood traumas: polytraumatization, dissociation, and schizophrenia. Community Ment Health J 51 (1):54-62. doi:10.1007/s10597-014-9755-2

4. Kessler RC, Sonnega A, Bromet E, Hughes M, Nelson CB (1995) Posttraumatic stress disorder in the National Comorbidity Survey. Arch Gen Psychiatry 52 (12):1048-1060

5. Grubaugh AL, Zinzow HM, Paul L, Egede LE, Frueh BC (2011) Trauma exposure and posttraumatic stress disorder in adults with severe mental illness: A critical review. Clin Psychol Rev 31 (6):883-899. doi:10.1016/j.cpr.2011.04.003

6. Bajor LA, Lai Z, Goodrich DE, Miller CJ, Penfold RB, Myra Kim H, Bauer MS, Kilbourne AM (2013) Posttraumatic stress disorder, depression, and health-related quality of life in patients with bipolar disorder: review and new data from a multi-site community clinic sample. J Affect Disord 145 (2):232-239. doi:10.1016/j.jad.2012.08.005

7. Heins M, Simons C, Lataster T, Pfeifer S, Versmissen D, Lardinois M, Marcelis M, Delespaul P, Krabbendam L, van Os J, Myin-Germeys I (2011) Childhood trauma and psychosis: a case-control and case-sibling comparison across different levels of genetic liability, psychopathology, and type of trauma. Am J Psychiatry 168 (12):1286-1294. doi:10.1176/appi.ajp.2011.10101531

8. Kelleher I, Keeley H, Corcoran P, Ramsay H, Wasserman C, Carli V, Sarchiapone M, Hoven C, Wasserman D, Cannon M (2013) Childhood trauma and psychosis in a prospective cohort study: cause, effect, and directionality. Am J Psychiatry 170 (7):734-741. doi:10.1176/appi.ajp.2012.12091169

9. Varese F, Smeets F, Drukker M, Lieverse R, Lataster T, Viechtbauer W, Read J, van Os J, Bentall RP (2012) Childhood adversities increase the risk of psychosis: a meta-analysis of patient-control, prospective- and cross-sectional cohort studies. Schizophr Bull 38 (4):661-671. doi:10.1093/schbul/sbs050

10. Hassan AN, De Luca V (2015) The effect of lifetime adversities on resistance to antipsychotic treatment in schizophrenia patients. Schizophr Res 161 (2-3):496-500. doi:10.1016/j.schres.2014.10.048

11. Ramsay CE, Flanagan P, Gantt S, Broussard B, Compton MT (2011) Clinical correlates of maltreatment and traumatic experiences in childhood and adolescence among predominantly African American, socially disadvantaged, hospitalized, first-episode psychosis patients. Psychiatry Res 188 (3):343-349. doi:10.1016/j.psychres.2011.05.019

12. Mueser KT, Essock SM, Haines M, Wolfe R, Xie H (2004) Posttraumatic stress disorder, supported employment, and outcomes in people with severe mental illness. CNS spectrums 9 (12):913-925

13. Lysaker PH, Larocco VA (2008) The prevalence and correlates of trauma-related symptoms in schizophrenia spectrum disorder. Compr Psychiatry 49 (4):330-334. doi:10.1016/j.comppsych.2007.12.003

14. Conus P, Cotton S, Schimmelmann BG, McGorry PD, Lambert M (2010) Pretreatment and outcome correlates of sexual and physical trauma in an epidemiological cohort of first-episode psychosis patients. Schizophr Bull 36 (6):1105-1114. doi:10.1093/schbul/sbp009

15. Duke LA, Allen DN, Ross SA, Strauss GP, Schwartz J (2010) Neurocognitive function in schizophrenia with comorbid posttraumatic stress disorder. J Clin Exp Neuropsychol 32 (7):737-751. doi:10.1080/13803390903512660

16. Mueser KT, Salyers MP, Rosenberg SD, Goodman LA, Essock SM, Osher FC, Swartz MS, Butterfield MI (2004) Interpersonal trauma and posttraumatic stress disorder in patients with severe mental illness: demographic, clinical, and health correlates. Schizophr Bull 30 (1):45

17. Ventevogel P, Ndayisaba H, van de Put W (2011) Psychosocial assistance and decentralised mental health care in post conflict Burundi 2000–2008. Intervention 9 (3):315-331

18. Kane JC, Ventevogel P, Spiegel P, Bass JK, van Ommeren M, Tol WA (2014) Mental, neurological, and substance use problems among refugees in primary health care: analysis of the Health Information System in 90 refugee camps. BMC Med 12:228. doi:10.1186/s12916-014-0228-9

19. Wang PS, Aguilar-Gaxiola S, Alonso J, Angermeyer MC, Borges G, Bromet EJ, Bruffaerts R, de Girolamo G, de Graaf R, Gureje O, Haro JM, Karam EG, Kessler RC, Kovess V, Lane MC, Lee S, Levinson D, Ono Y, Petukhova M, Posada-Villa J, Seedat S, Wells JE (2007) Use of mental health services for anxiety, mood, and substance disorders in 17 countries in the WHO world mental health surveys. Lancet 370 (9590):841-850. doi:10.1016/s0140-6736(07)61414-7

20. Abdulahi H, Mariam DH, Kebede D (2001) Burden of disease analysis in rural Ethiopia. Ethiop Med J 39 (4):271-281

21. Fekadu A, Medhin G, Kebede D, Alem A, Cleare AJ, Prince M, Hanlon C, Shibre T (2015) Excess mortality in severe mental illness: 10-year population-based cohort study in rural Ethiopia. Br J Psychiatry 206 (4):289-296. doi:10.1192/bjp.bp.114.149112

22. Assefa D, Shibre T, Asher L, Fekadu A (2012) Internalized stigma among patients with schizophrenia in Ethiopia: a cross-sectional facility-based study. BMC Psychiatry 12:239. doi:10.1186/1471-244x-12-239

23. Girma E, Tesfaye M, Froeschl G, Moller-Leimkuhler AM, Dehning S, Muller N (2013) Facility based cross-sectional study of self stigma among people with mental illness: towards patient empowerment approach. Int J Ment Health Syst 7 (1):21. doi:10.1186/1752-4458-7-21

24. Girma E, Moller-Leimkuhler AM, Muller N, Dehning S, Froeschl G, Tesfaye M (2014) Public stigma against family members of people with mental illness: findings from the Gilgel Gibe Field

Research Center (GGFRC), Southwest Ethiopia. BMC Int Health Hum Rights 14:2. doi:10.1186/1472-698x-14-2

25. Girma E, Tesfaye M, Froeschl G, Moller-Leimkuhler AM, Muller N, Dehning S (2013) Public stigma against people with mental illness in the Gilgel Gibe Field Research Center (GGFRC) in Southwest Ethiopia. PLoS One 8 (12):e82116. doi:10.1371/journal.pone.0082116

26. Girma E, Moller-Leimkuhler AM, Dehning S, Mueller N, Tesfaye M, Froeschl G (2014) Self-stigma among caregivers of people with mental illness: toward caregivers' empowerment. J Multidiscip Healthc 7:37-43. doi:10.2147/jmdh.s57259

27. Mulatu MS (1999) Perceptions of mental and physical illnesses in north-western Ethiopia: Causes, treatments, and attitudes. J Health Psychol 4 (4):531-549. doi:10.1177/135910539900400407

28. Shibre T, Negash A, Kullgren G, Kebede D, Alem A, Fekadu A, Fekadu D, Madhin G, Jacobsson L (2001) Perception of stigma among family members of individuals with schizophrenia and major affective disorders in rural Ethiopia. Soc Psychiatry Psychiatr Epidemiol 36 (6):299-303

29. Shibre T, Kebede D, Alem A, Negash A, Deyassa N, Fekadu A, Fekadu D, Jacobsson L, Kullgren G (2003) Schizophrenia: illness impact on family members in a traditional society--rural Ethiopia. Soc Psychiatry Psychiatr Epidemiol 38 (1):27-34. doi:10.1007/s00127-003-0594-7

30. Teferra S, Shibre T, Fekadu A, Medhin G, Wakwoya A, Alem A, Kullgren G, Jacobsson L (2011) Five-year mortality in a cohort of people with schizophrenia in Ethiopia. BMC Psychiatry 11:165. doi:10.1186/1471-244x-11-165

31. Fekadu A, Hanlon C, Medhin G, Alem A, Selamu M, Giorgis TW, Shibre T, Teferra S, Tegegn T, Breuer E, Patel V, Tomlinson M, Thornicroft G, Prince M, Lund C (2015) Development of a scalable mental healthcare plan for a rural district in Ethiopia. Br J Psychiatry

32. Alem A (2000) Human rights and psychiatric care in Africa with particular reference to the Ethiopian situation. Acta Psychiatr Scand Suppl 399:93-96

33. Tsigebrhan R, Shibre T, Medhin G, Fekadu A, Hanlon C (2014) Violence and violent victimization in people with severe mental illness in a rural low-income country setting: a comparative cross-sectional community study. Schizophr Res 152 (1):275-282. doi:10.1016/j.schres.2013.10.032

34. Saxena S, Thornicroft G, Knapp M, Whiteford H (2007) Resources for mental health: scarcity, inequity, and inefficiency. Lancet 370 (9590):878-889. doi:10.1016/s0140-6736(07)61239-2

35. World Health Organization (2014) Mental health atlas. WHO Press, Geneva

36. Tirfessa K, Lund C, Medhin G, Hailemichael Y, Fekadu A, Hanlon C (2017) Food insecurity among people with severe mental disorder in a rural Ethiopian setting: a comparative, population-based study. Epidemiology and psychiatric sciences:1-11. doi:10.1017/s2045796017000701

37. Lund C, Tomlinson M, De Silva M, Fekadu A, Shidhaye R, Jordans M, Petersen I, Bhana A, Kigozi F, Prince M, Thornicroft G, Hanlon C, Kakuma R, McDaid D, Saxena S, Chisholm D, Raja S, Kippen-Wood S, Honikman S, Fairall L, Patel V (2012) PRIME: a programme to reduce the treatment gap for mental disorders in five low- and middle-income countries. PLoS Med 9 (12):e1001359. doi:10.1371/journal.pmed.1001359

38. Fekadu A, Medhin G, Selamu M, Hailemariam M, Alem A, Giorgis TW, Breuer E, Lund C, Prince M, Hanlon C (2014) Population level mental distress in rural Ethiopia. BMC Psychiatry 14:194. doi:10.1186/1471-244x-14-194

39. Hanlon C, Luitel NP, Kathree T, Murhar V, Shrivasta S, Medhin G, Ssebunnya J, Fekadu A, Shidhaye R, Petersen I (2014) Challenges and opportunities for implementing integrated mental health care: a district level situation analysis from five low-and middle-income countries. PloS one 9 (2):e88437

40. Alem A, Jacobsson L, Araya M, Kebede D, Kullgren G (1999) How are mental disorders seen and where is help sought in a rural Ethiopian community? A key informant study in Butajira, Ethiopia. Acta Psychiatr Scund 100:40-47

41. World Health Organization (2010) mhGAP intervention guide for mental, neurological and substance use disorders in non-specialized health settings: Mental Health Gap Action Programme (mhGAP). World Health Organization, Geneva

42. WHO (2008) Mental Health Gap Action Programme Scaling up care for mental, neurological, and substance use disorders. WHO, Geneva

43. Rucker J, Newman S, Gray J, Gunasinghe C, Broadbent M, Brittain P, Baggaley M, Denis M, Turp J, Stewart R, Lovestone S, Schumann G, Farmer A, McGuffin P (2011) OPCRIT+: an electronic system for psychiatric diagnosis and data collection in clinical and research settings. Br J Psychiatry 199 (2):151-155. doi:10.1192/bjp.bp.110.082925

44. Lukoff D, Liberman RP, Nuechterlein KH (1986) Symptom monitoring in the rehabilitation of schizophrenic patients. Schizophr Bull 12 (4):578-602

45. Brugha TS, Cragg D (1990) The List of Threatening Experiences: the reliability and validity of a brief life events questionnaire. Acta Psychiatr Scand 82 (1):77-81

46. Kroenke K, Spitzer RL, Williams JBW (2001) The PHQ-9: Validity of a Brief Depression Severity Measure. J Gen Intern Med 16 (9):606-613. doi:10.1046/j.1525-1497.2001.016009606.x

47. Hanlon C, Medhin G, Selamu M, Breuer E, Worku B, Hailemariam M, Lund C, Prince M, Fekadu A (2015) Validity of brief screening questionnaires to detect depression in primary care in Ethiopia. J Affect Disord 186:32-39. doi:10.1016/j.jad.2015.07.015

48. Kessler RC, Ustun TB (2004) The World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). Int J Methods Psychiatr Res 13 (2):93-121

49. Babor TF, Higgins-Biddle JC, Saunders JB, Monteiro MG (2001) AUDIT: the Alcohol Use Disorders Identification Test: guidelines for use in primary health care. World Health Organization, Geneva

50. StataCorp (2015) Stata Statistical Software: Release 14. StataCorp LP., College Station, TX

51. Asher L, Fekadu A, Teferra S, De Silva M, Pathare S, Hanlon C (2017) "I cry every day and night, I have my son tied in chains": physical restraint of people with schizophrenia in community settings in Ethiopia. Globalization and health 13 (1):47. doi:10.1186/s12992-017-0273-1

52. Kessler RC (1997) The effects of stressful life events on depression. Annu Rev Psychol 48:191-214. doi:10.1146/annurev.psych.48.1.191

53. Kendler KS, Karkowski LM, Prescott CA (1999) Causal Relationship Between Stressful Life Events and the Onset of Major Depression. Am J Psychiatry 156 (6):837-841. doi:10.1176/ajp.156.6.837

Table 1. Demographics and Association with trauma exposure and stressful life events

			Factors associated with traumatic and stressful events								
			Restraint last 12 mos.			Traumatic Events			Stressful life events		
Demographic indicator	N	%	N	%	Test statistic	Mean	SD	Test statistic	Mean	SD	Test statistic
Sex											
Female	128	42.67	23	17.97	X^2=5.39	0.47	1.03	t(298)=2.79	1.69	1.69	t(298)=1.19
Male	172	57.33	51	29.65	*p*=0.02	0.83	1.17	*p*=0.006	1.95	2.00	*p*=0.24
Age, M(SD)	35.51	13.32			OR=0.97 *p*=.009			IRR= 1.00, *p*=0.48			IRR=1.00, *p*=0.82
Years mental illness, M(SD)	12.34	12.14			OR=0.97 *p*= 0.03			IRR=1.00, *p*=0.79			IRR=0.99, *p*=.051
Psychiatric symptoms (BPRS-E), M(SD)	48.40	15.60			OR=1.01 p=0.51			IRR=0.98 *p*<.001			IRR=1.00 *p*=0.54

Table 2. Traumatic and stressful events by gender

Event	Total		Men		Women		Difference	
	N	%	n	%	n	%	X^2	*p*
Restrained since illness	139	46.33	90	52.33	49	38.28	5.82	.02
Restrained last 12 months	74	24.67	51	29.65	23	17.97	5.39	.02
Traumatic Events								
Beaten	52	19.55	41	26.62	11	9.82	11.64	.001
Hit by car	11	3.67	10	5.81	1	0.78	5.26	.02
Been in a fire	3	1.00	1	0.58	2	1.56	0.71	.40
Attacked with a gun	1	0.33	0	0.00	1	0.78	1.35	.25
Hit by bicycle/cart	6	2.00	5	2.91	1	0.78	1.69	.19
Fell off cliff/into ditch or pit	10	3.33	8	4.65	2	1.56	2.17	.14
Fell into water	4	1.33	3	1.74	1	0.78	0.52	.47
Electrical accident	2	0.67	2	1.16	0	0.00	1.50	.22
Raped[1]	8	3.09	0	0.00	8	7.14	10.83	.001
Attacked by animal	24	8.03	16	9.36	8	6.25	0.96	.33
Other accident	3	1.00	2	1.16	1	.078	0.11	.74
Assaulted	71	23.75	48	27.91	23	18.11	3.87	.049
Maltreated in prison	8	2.67	7	4.07	1	0.78	3.06	.08
Any Traumatic Event	107	35.67	75	43.60	32	25.00	11.07	.001
Total Number of Traumatic Events	M= 0.66	SD= 1.13	M= 0.83	SD= 1.17	M= 0.47	SD= 1.03	t(298)= 2.78	.006
Stressful Life Events last 6 months								
Serious illness or injury, self	80	26.76	47	27.33	33	25.98	0.07	.80
Serious illness or injury, close friend or family	35	11.95	22	13.02	13	10.48	0.44	.51
Death of spouse, child, or parent	32	10.74	17	9.94	15	11.81	0.27	.61
Death of other close relative or friend	50	16.72	27	15.70	23	18.11	0.31	.58
Marital difficulties	32	10.70	17	9.88	15	11.81	0.28	.59
Broke off steady relationship	48	16.05	28	16.28	20	15.75	0.02	.90
Serious problem with friends or family	34	11.37	23	13.37	11	8.66	1.61	.21
Joblessness	80	26.76	52	30.23	28	22.05	2.50	.11
Financial crisis	111	37.12	73	42.44	38	29.92	4.91	.03
Important thing stolen	26	8.70	16	9.30	10	7.87	0.19	.67
Problems with police	23	7.69	13	7.56	10	7.87	0.01	.92
Any Stressful Life Event	207	69.00	118	68.60	89	69.53	0.03	.86
Total Number of Stressful Life Events	M= 1.84	SD= 1.88	M= 1.95	SD= 2.00	M= 1.69	SD= 1.69	t(298)=1.19	.24

[1]Rape specifies rape by a community member or friend.

Table 3. Mutivariable analyses of trauma experiences in relation to mental health characteristics

Predictor	**Hazardous Drinking**			**Depression Symptoms**			**Suicidal Ideation**			**Suicide Attempt**		
	OR	**95% CI**	**p**	**b**	**95% CI**	**p**	**OR**	**95% CI**	**p**	**OR**	**95% CI**	**p**
Restrained past 12 months	0.36	0.18, 0.73	.005	-0.83	-2.10, 0.45	.204	2.02	1.13, 3.617	.017	0.95	0.43, 2.11	.900
Traumatic Events since illness	1.45	1.10, 1.91	.009	0.13	-0.40, 0.67	.619	1.05	0.83, 1.34	.672	1.08	0.80, 1.45	.62
Stressful Events past 6 months	1.12	0.95, 1.32	.171	0.66	0.35, 0.97	<.001	1.37	1.18, 1.59	<.001	1.19	1.00, 1.42	.056

Note. Sex and age were included in all analyses. Psychiatric symptoms were also included in the regression predicting Depression Symptoms.